

# MODUL PRAKTIKUM 09

## NETWORK ADDRESS TRANSLATION DAN WIRELESS LAN

### TUJUAN

Setelah praktikum dilaksanakan, peserta praktikum diharapkan memiliki kemampuan

1. Melakukan konfigurasi NAT pada Linux Ubuntu 8.10
2. Melakukan konfigurasi NAT pada Windows Server 2008
3. Melakukan konfigurasi Access Point

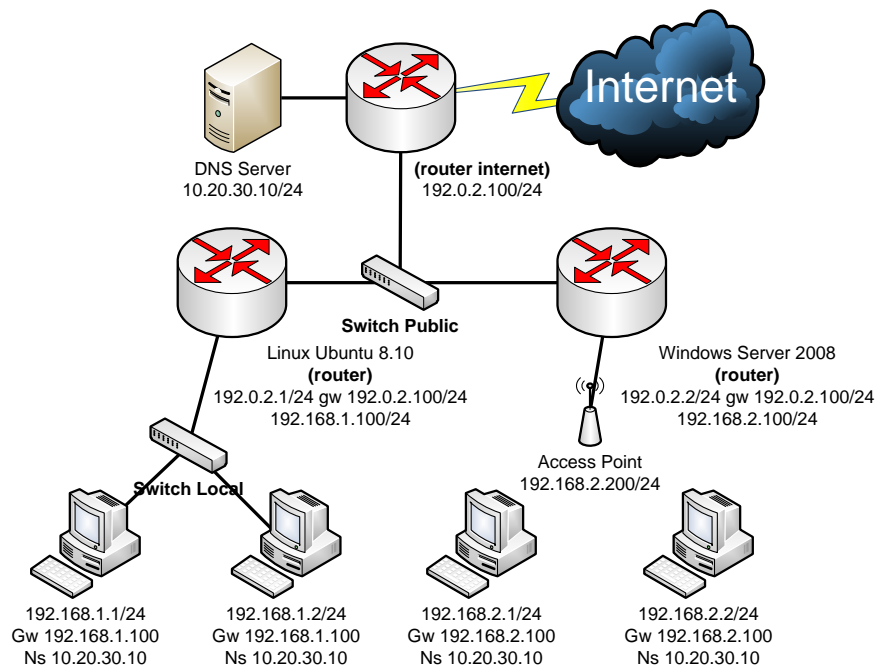
### PERANGKAT

Perangkat yang digunakan untuk praktikum adalah sbb :

1. Linux Ubuntu 8.10
2. Windows Server 2008
3. Access Point DWL-2100AP
4. Kabel UTP Straight atau Cross
5. Switch

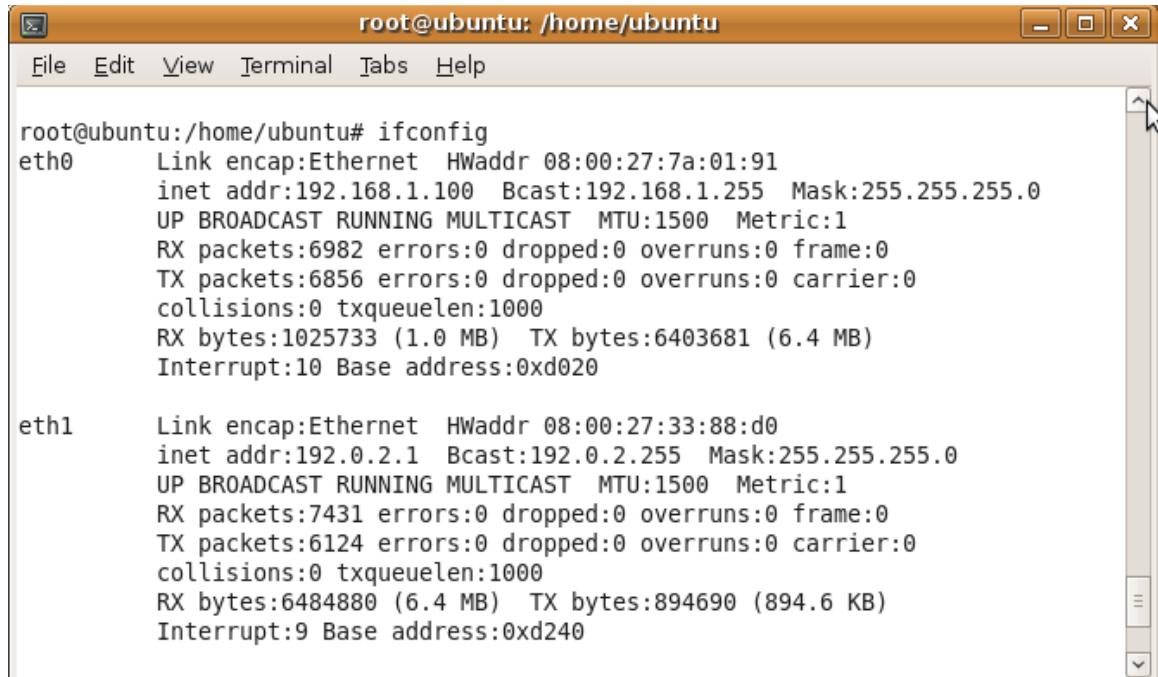
### PROSEDUR PRAKTIKUM

Berikut topologi yang akan dijadikan materi praktikum :



## 1. Melakukan konfigurasi NAT pada Linux Ubuntu 8.10

- a. Tambahkan IP Address pada interface yang sesuai



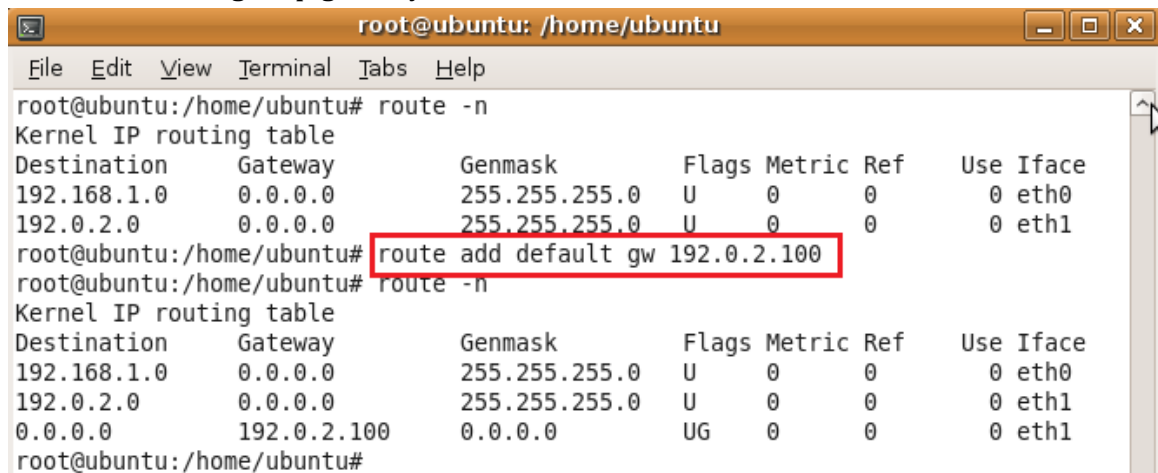
```
root@ubuntu: /home/ubuntu
File Edit View Terminal Tabs Help

root@ubuntu:/home/ubuntu# ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:7a:01:91
          inet addr:192.168.1.100  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:6982 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6856 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1025733 (1.0 MB)  TX bytes:6403681 (6.4 MB)
          Interrupt:10 Base address:0xd020

eth1      Link encap:Ethernet  HWaddr 08:00:27:33:88:d0
          inet addr:192.0.2.1  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:7431 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6124 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:6484880 (6.4 MB)  TX bytes:894690 (894.6 KB)
          Interrupt:9 Base address:0xd240
```

- b. Tambahkan default gateway dengan perintah

**"route add default gw <ip\_gateway>"**

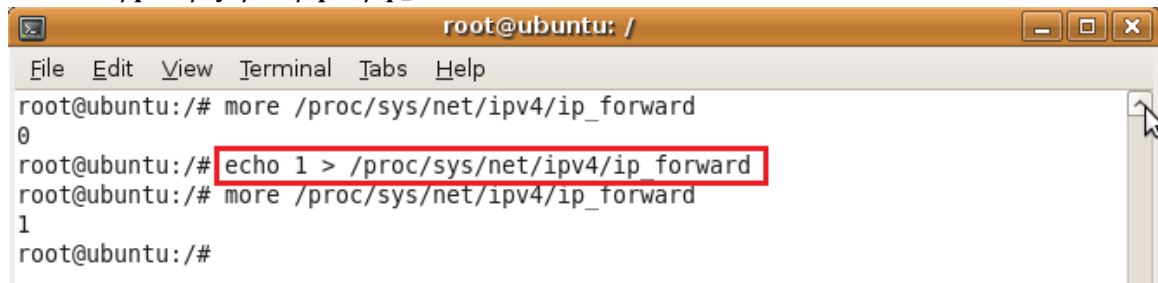


```
root@ubuntu: /home/ubuntu
File Edit View Terminal Tabs Help

root@ubuntu:/home/ubuntu# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
192.0.2.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
root@ubuntu:/home/ubuntu# route add default gw 192.0.2.100
root@ubuntu:/home/ubuntu# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
192.0.2.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
0.0.0.0 192.0.2.100 0.0.0.0 UG 0 0 0 eth1
root@ubuntu:/home/ubuntu#
```

- c. Hidupkan service Routing (ip\_forwarding) dengan perintah

**"echo 1 > /proc/sys/net/ipv4/ip\_forward"**

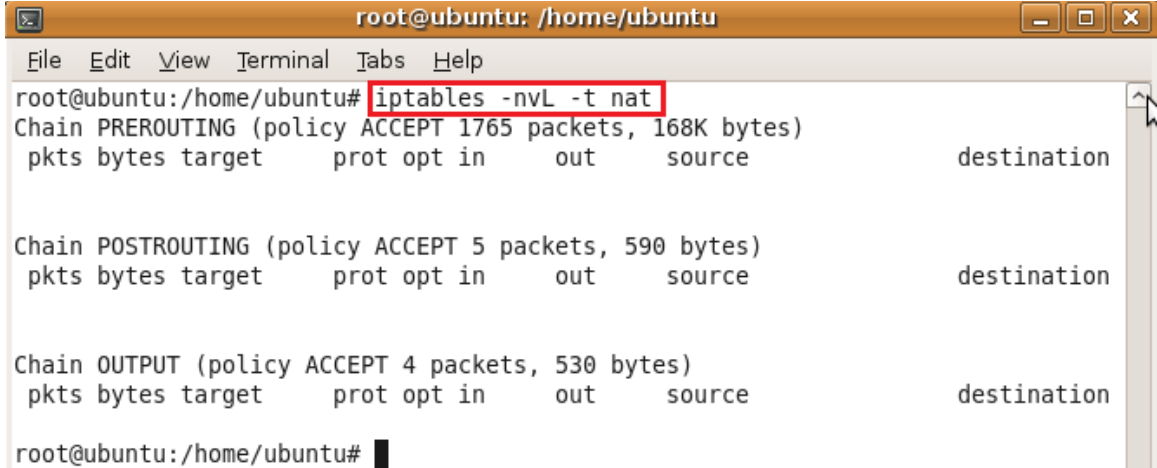


```
root@ubuntu: /
File Edit View Terminal Tabs Help

root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
0
root@ubuntu:/# echo 1 > /proc/sys/net/ipv4/ip_forward
root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
1
root@ubuntu:/#
```

- d. Periksa tabel NAT pada iptables dengan perintah

**“iptables -nvL -t nat”**



```
root@ubuntu: /home/ubuntu
File Edit View Terminal Tabs Help
root@ubuntu:/home/ubuntu# iptables -nvL -t nat
Chain PREROUTING (policy ACCEPT 1765 packets, 168K bytes)
pkts bytes target      prot opt in      out     source      destination

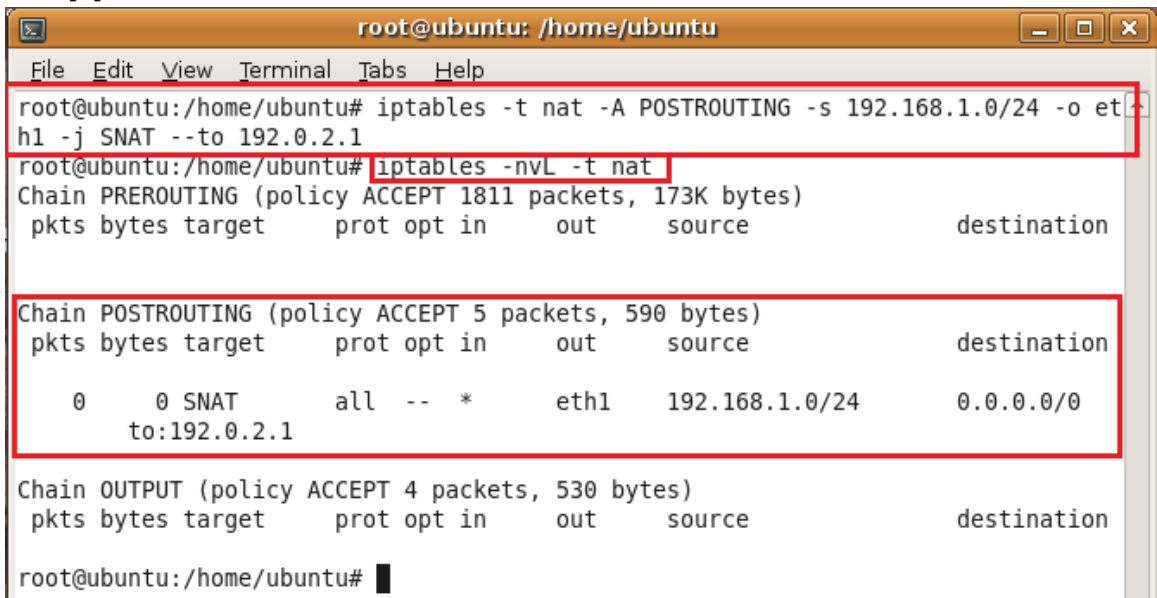
Chain POSTROUTING (policy ACCEPT 5 packets, 590 bytes)
pkts bytes target      prot opt in      out     source      destination

Chain OUTPUT (policy ACCEPT 4 packets, 530 bytes)
pkts bytes target      prot opt in      out     source      destination

root@ubuntu:/home/ubuntu#
```

- e. Tambahkan nat untuk jaringan lokal dengan perintah

**“iptables -t nat -A POSTROUTING -s <local-network/prefix> -o <ethernet-public> -j SNAT -to <ip-public>”**



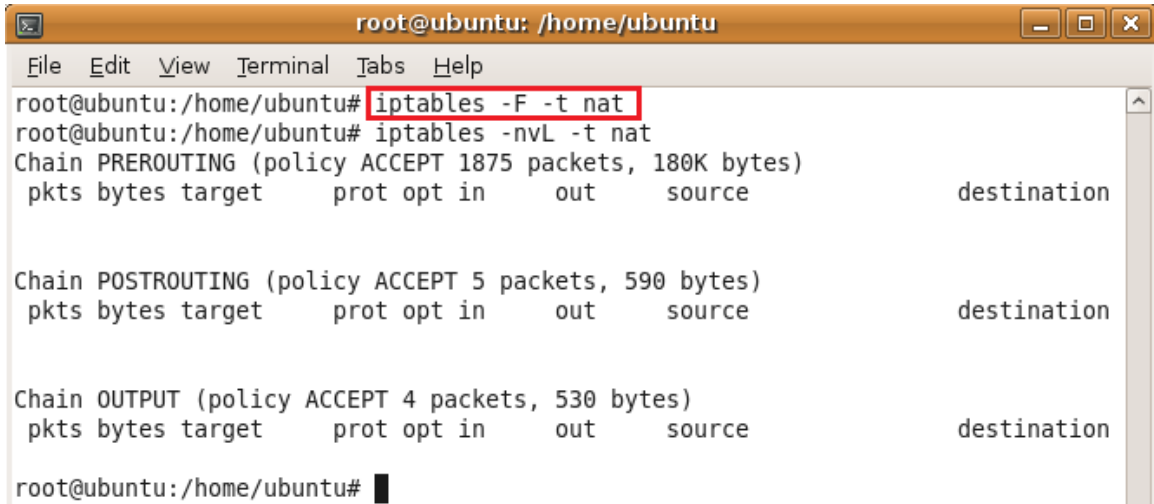
```
root@ubuntu: /home/ubuntu
File Edit View Terminal Tabs Help
root@ubuntu:/home/ubuntu# iptables -t nat -A POSTROUTING -s 192.168.1.0/24 -o eth1 -j SNAT --to 192.0.2.1
root@ubuntu:/home/ubuntu# iptables -nvL -t nat
Chain PREROUTING (policy ACCEPT 1811 packets, 173K bytes)
pkts bytes target      prot opt in      out     source      destination

Chain POSTROUTING (policy ACCEPT 5 packets, 590 bytes)
pkts bytes target      prot opt in      out     source      destination
 0    0 SNAT      all  --  *      eth1   192.168.1.0/24  0.0.0.0/0
    to:192.0.2.1

Chain OUTPUT (policy ACCEPT 4 packets, 530 bytes)
pkts bytes target      prot opt in      out     source      destination

root@ubuntu:/home/ubuntu#
```

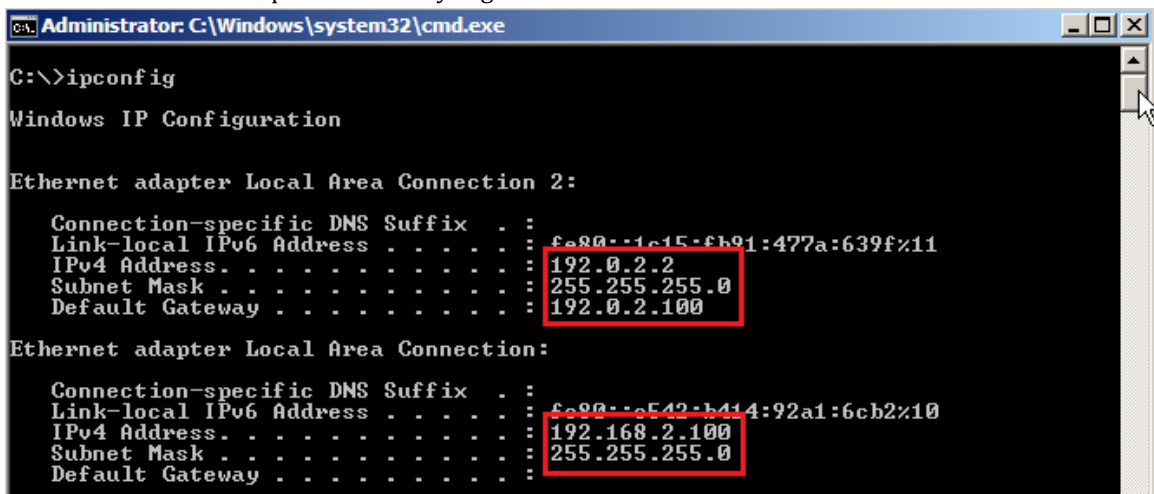
- f. Jika ada kesalahan penambahan dalam table nat, dapat dihilangkan seluruhnya dengan perintah **"iptables -F -t nat"**



```
root@ubuntu: /home/ubuntu
File Edit View Terminal Tabs Help
root@ubuntu:/home/ubuntu# iptables -F -t nat
root@ubuntu:/home/ubuntu# iptables -nvL -t nat
Chain PREROUTING (policy ACCEPT 1875 packets, 180K bytes)
 pkts bytes target    prot opt in     out     source destination
Chain POSTROUTING (policy ACCEPT 5 packets, 590 bytes)
 pkts bytes target    prot opt in     out     source destination
Chain OUTPUT (policy ACCEPT 4 packets, 530 bytes)
 pkts bytes target    prot opt in     out     source destination
root@ubuntu:/home/ubuntu#
```

## 2. Melakukan konfigurasi NAT pada Windows Server 2008

- a. Tambahkan IP Address pada interface yang sesuai



```
Administrator: C:\Windows\system32\cmd.exe
C:\>ipconfig

Windows IP Configuration

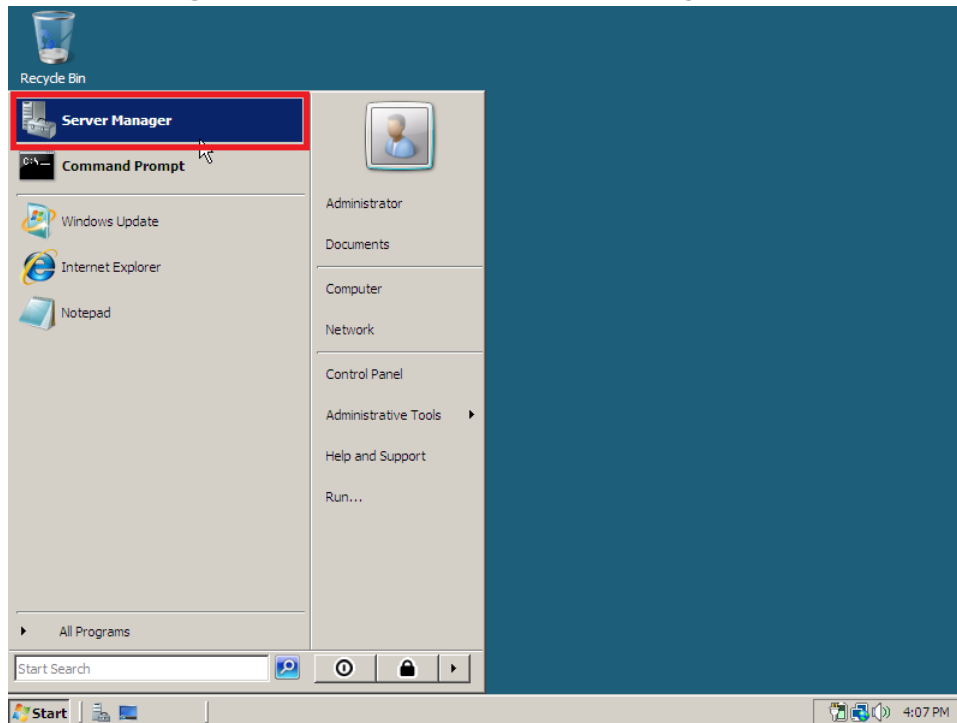
Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::1c15:fb91:477a:639f%11
    IPv4 Address. . . . . : 192.0.2.2
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.0.2.100

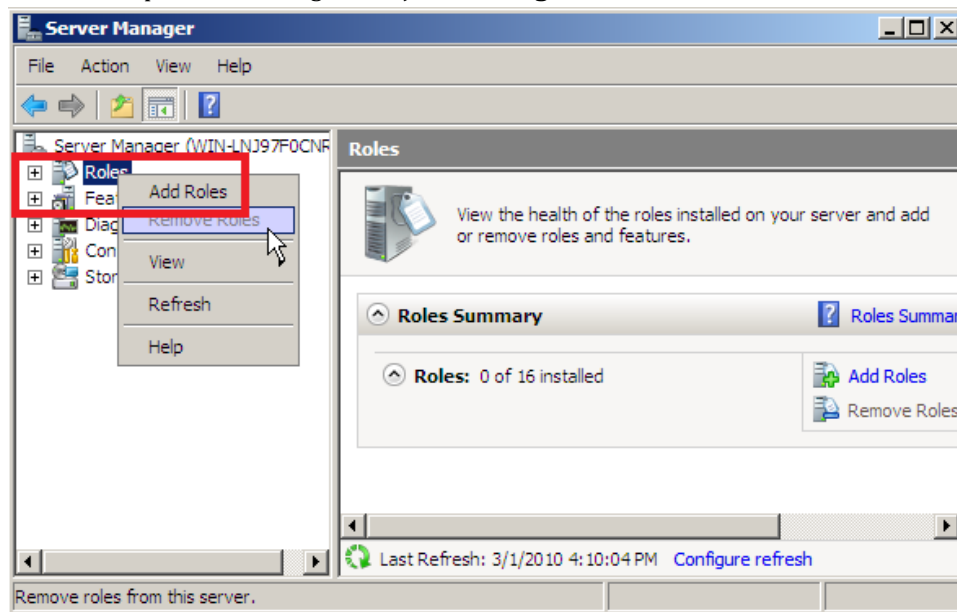
Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::a542:b414:92a1:6cb2%10
    IPv4 Address. . . . . : 192.168.2.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
```

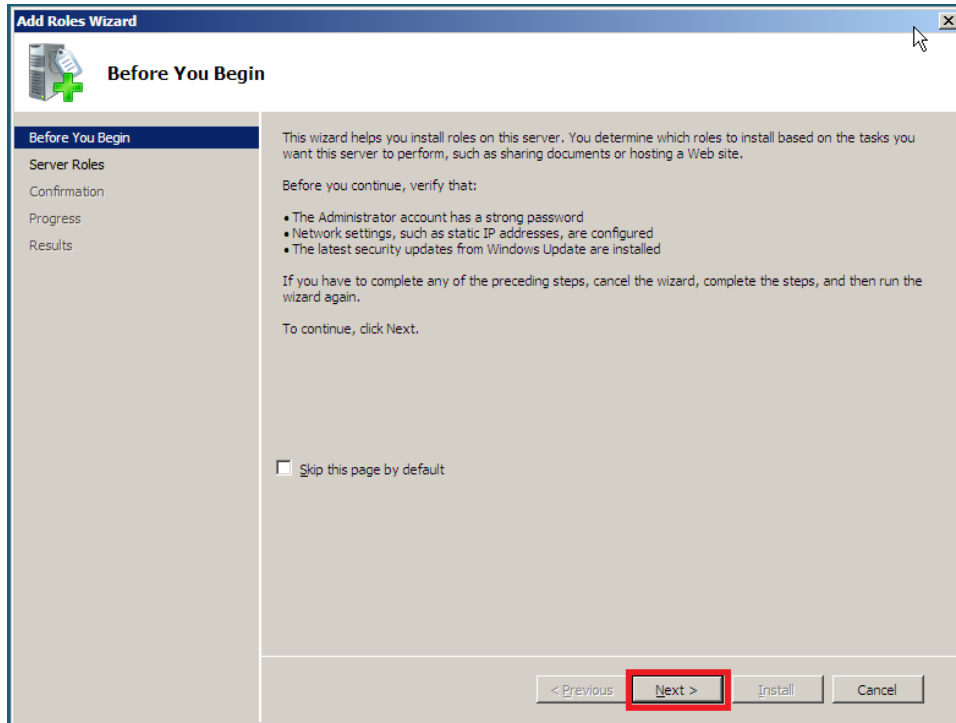
b. Instalasi **Routing and Remote Access** melalui Server Manager



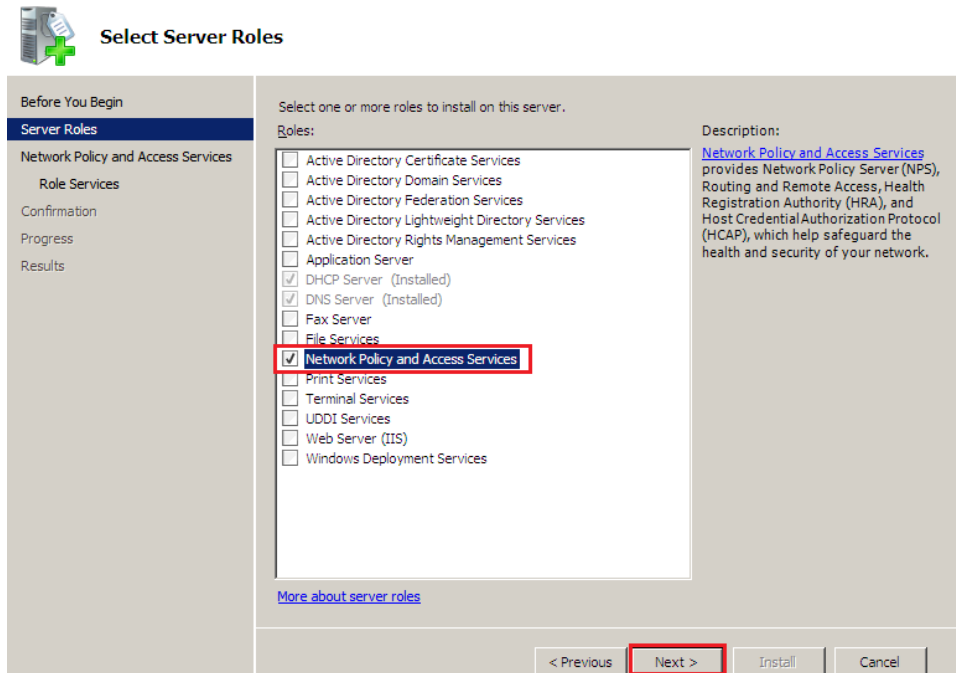
c. Tambahkan peran Server agar menjadi **Routing and Remote Access**



d. Ikuti Wizard instalasi



e. Pilih peran "Network Policy and Access Services"





## Network Policy and Access Services

Before You Begin

Server Roles

**Network Policy and Access Services**

Role Services

Confirmation

Progress

Results

### Introduction to Network Policy and Access Services

Network Policy and Access Services allows you to provide local and remote network access and to define and enforce policies for network access authentication, authorization, and client health using Network Policy Server (NPS), Routing and Remote Access Service, Health Registration Authority (HRA), and Host Credential Authorization Protocol (HCAP).

#### Things to Note

- You can deploy NPS as a Remote Authentication Dial-In User Service (RADIUS) server and proxy and as a Network Access Protection (NAP) policy server. After installing NPS using this wizard, you can configure NPS from the NPAS home page using the NPS console.
- NAP helps you ensure that computers connecting to the network are compliant with organization network and client health policies. After installing NPS using this wizard, you can configure NAP from the NPAS home page using the NPS console.

#### Additional Information

- [Overview of Network Policy and Access Services](#)
- [NAP enforcement methods](#)
- [Network Access Protection \(NAP\) in NPS](#)
- [Network Policy Server](#)

< Previous **Next >** Install Cancel

f. Pilih **“Routing and Remote Access Services”** serta konfirmasi instalasi



## Select Role Services

Before You Begin

Server Roles

Network Policy and Access Services

**Role Services**

Confirmation

Progress

Results

Select the role services to install for Network Policy and Access Services:

Role services:

- Network Policy Server
- Routing and Remote Access Services**
- Remote Access Service
- Routing
- Health Registration Authority
- Host Credential Authorization Protocol

Description:

[Routing and Remote Access Services](#) provides remote users access to resources on your private network over virtual private network (VPN) or dial-up connections. Servers configured with the Routing and Remote Access service can provide LAN and WAN routing services used to connect network segments within a small office or to connect two private networks over the internet.

[More about role services](#)

< Previous **Next >** Install Cancel

### Confirm Installation Selections

Before You Begin  
Server Roles  
Network Policy and Access Services  
Role Services  
**Confirmation**  
Progress  
Results

To install the following roles, role services, or features, click Install.

1 informational message below

This server might need to be restarted after the installation completes.

- Network Policy and Access Services
  - Routing and Remote Access Services
  - Remote Access Service
  - Routing

[Print, e-mail, or save this information](#)

< Previous   Next >   **Install**   Cancel

### Installation Progress

Before You Begin  
Server Roles  
Network Policy and Access Services  
Role Services  
Confirmation  
**Progress**  
Results

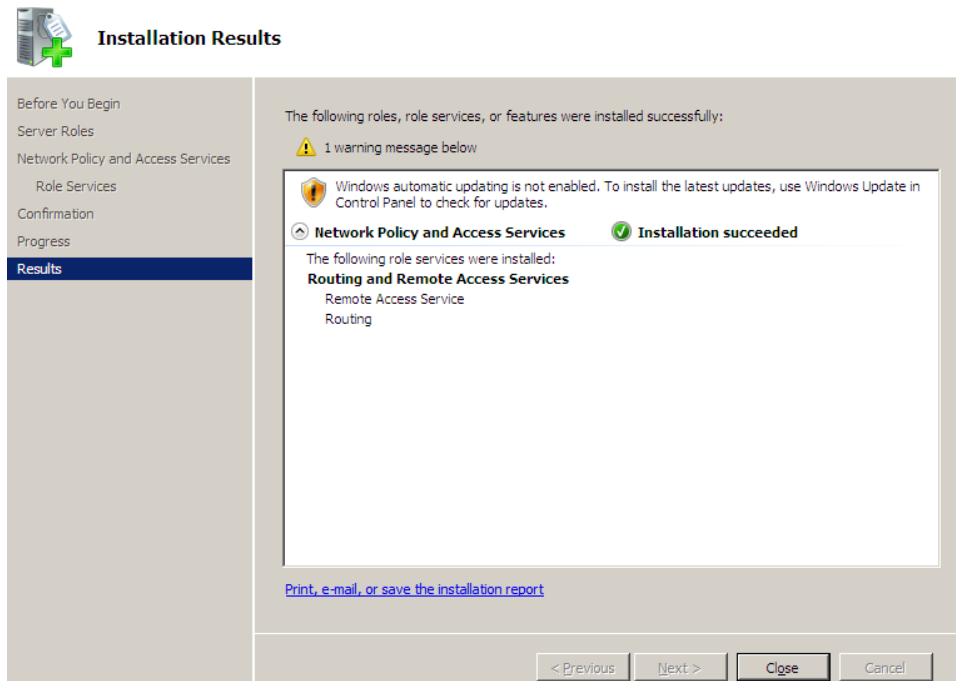
The following roles, role services, or features are being installed:

- Network Policy and Access Services

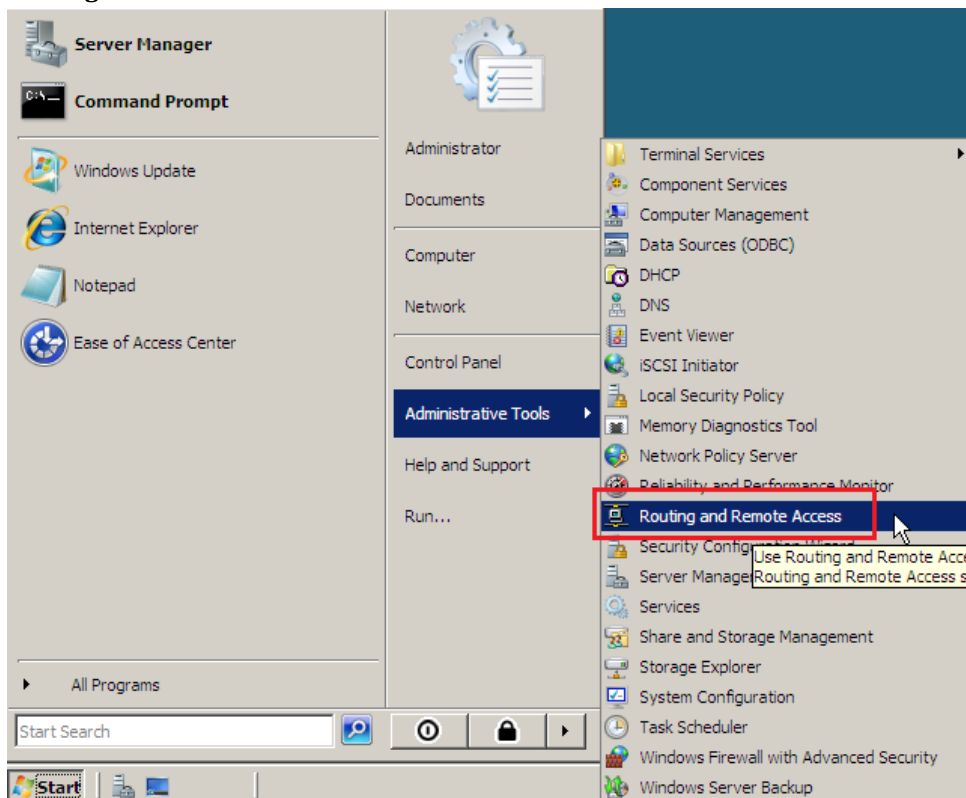
Initializing installation...

< Previous   Next >   **Install**   Cancel

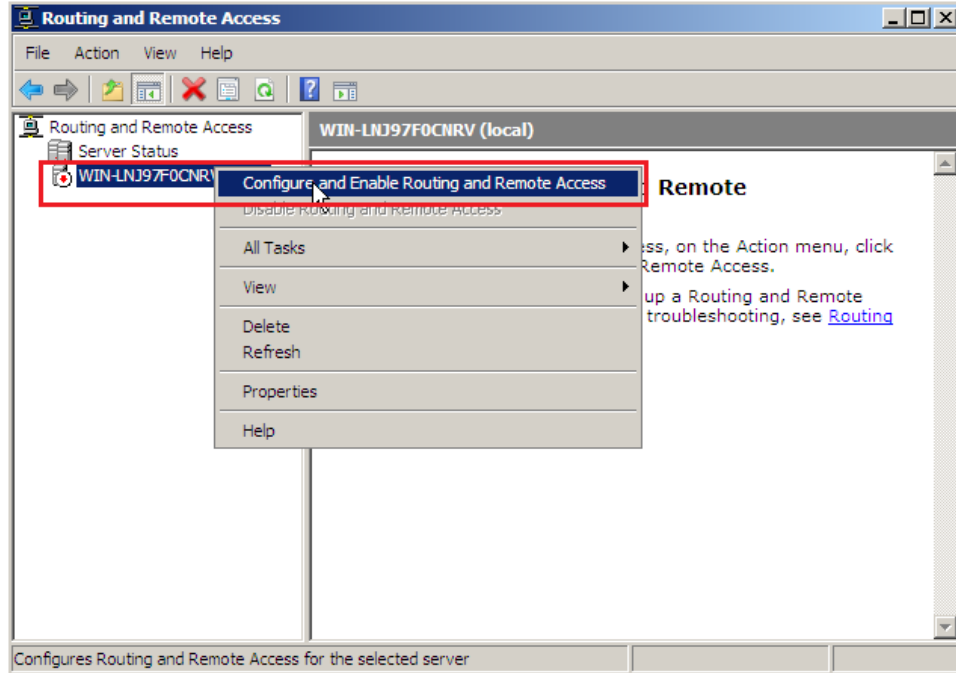




- g. Pengaturan Routing and Remote Access dapat dilakukan melalui **Administrative Tools – Routing And Remote Access**



- h. Setelah jendela Routing and Remote Access terbuka, klik kanan pada komputer dan pilih **“Configure and Enable Routing and Remote Access”**



- i. Ikuti Setup Wizard



**Routing and Remote Access Server Setup Wizard**

**Configuration**  
You can enable any of the following combinations of services, or you can customize this server.

- Remote access (dial-up or VPN)  
Allow remote clients to connect to this server through either a dial-up connection or a secure virtual private network (VPN) Internet connection.
- Network address translation (NAT)  
Allow internal clients to connect to the Internet using one public IP address.
- Virtual private network (VPN) access and NAT  
Allow remote clients to connect to this server through the Internet and local clients to connect to the Internet using a single public IP address.
- Secure connection between two private networks  
Connect this network to a remote network, such as a branch office.
- Custom configuration  
Select any combination of the features available in Routing and Remote Access.

[For more information](#)

< Back   **Next >**   Cancel

**Routing and Remote Access Server Setup Wizard**

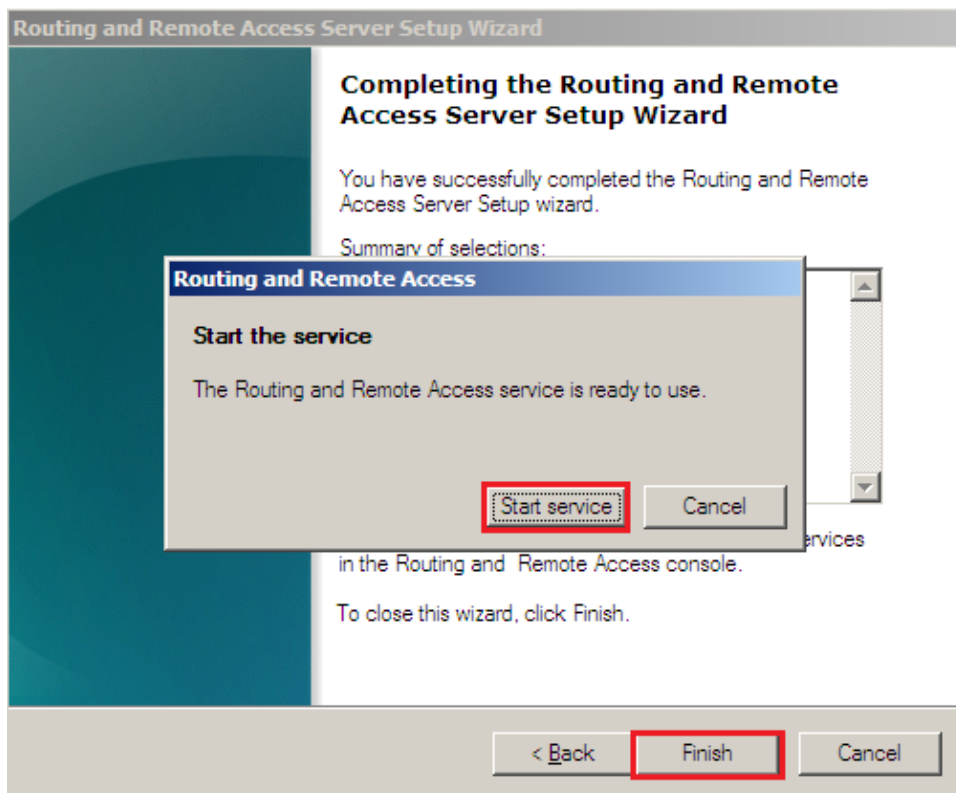
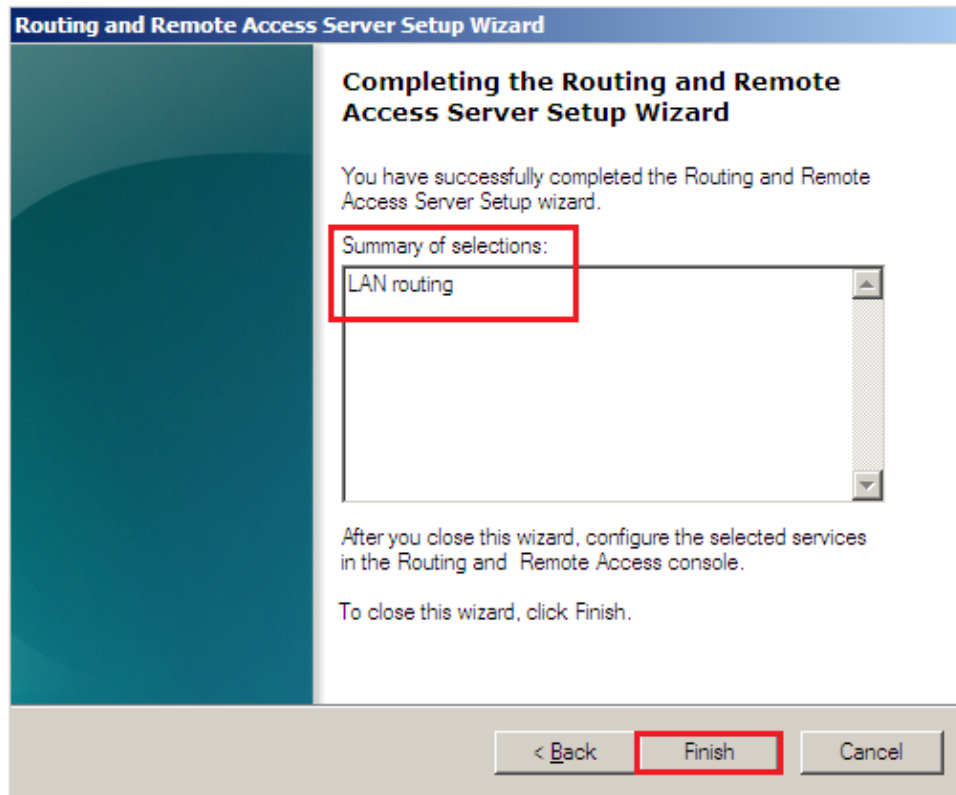
**Custom Configuration**  
When this wizard closes, you can configure the selected services in the Routing and Remote Access console.

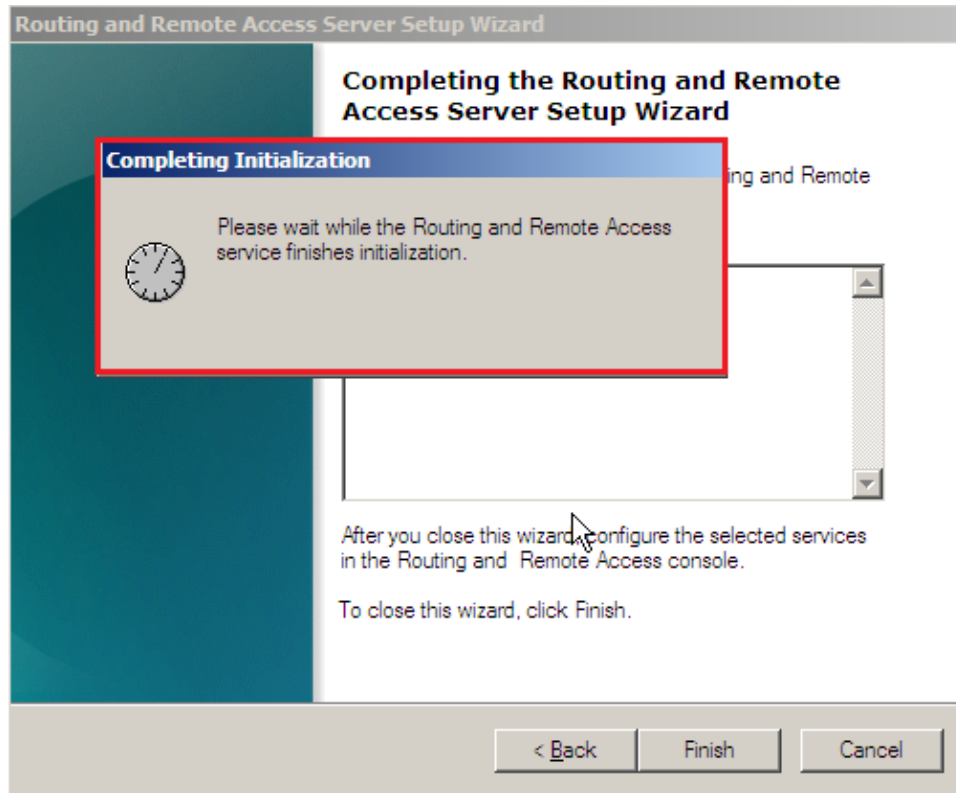
Select the services that you want to enable on this server.

- VPN access
- Dial-up access
- Demand-dial connections ( used for branch office routing )
- NAT
- LAN routing

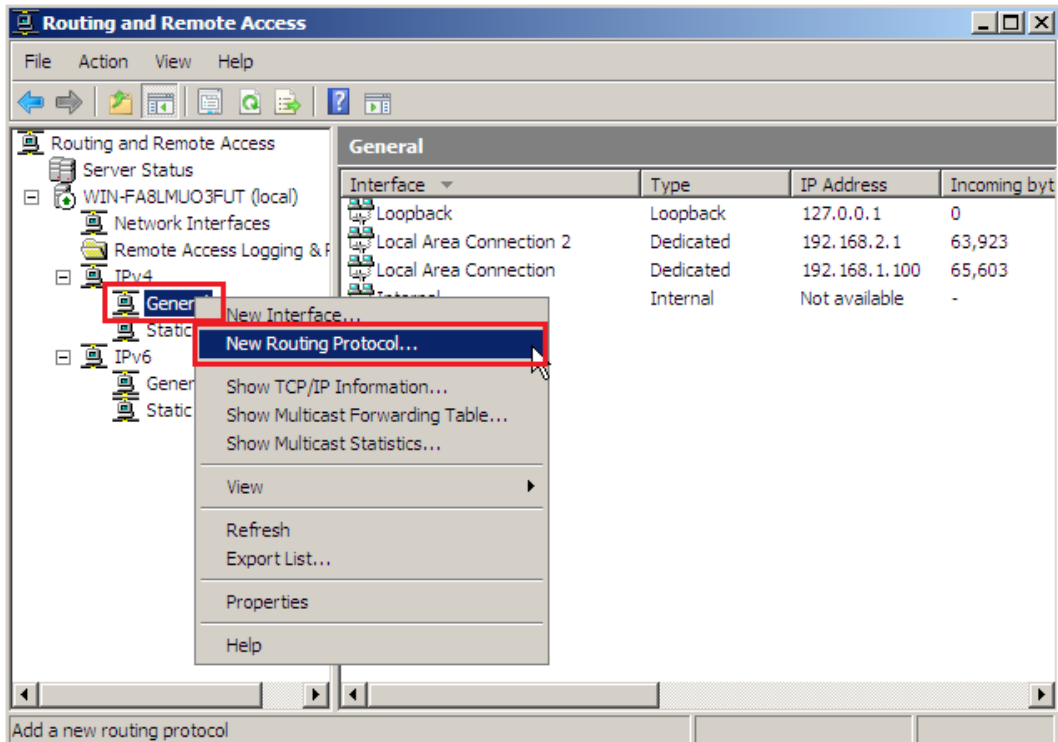
[For more information](#)

< Back   **Next >**   Cancel

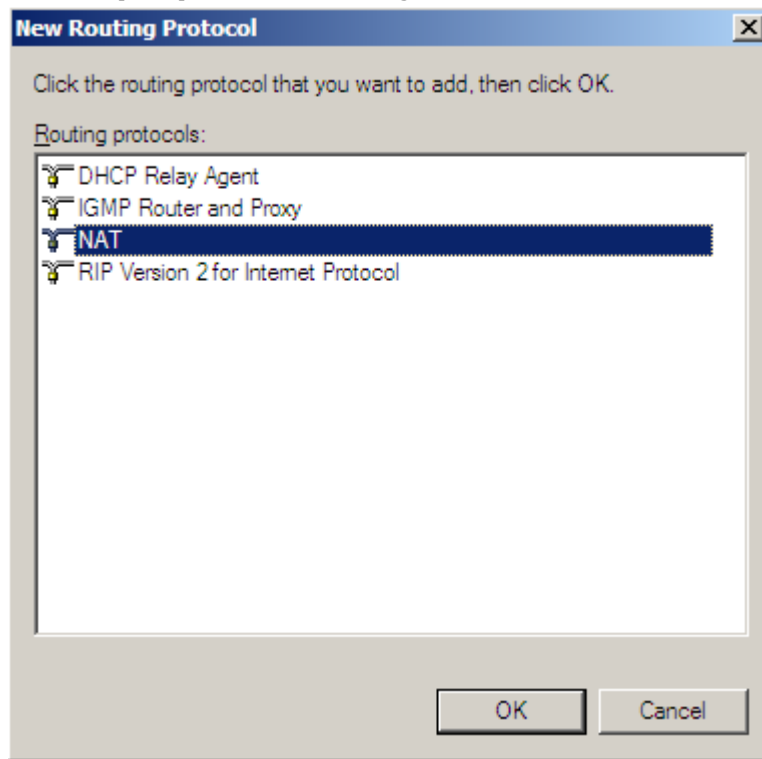




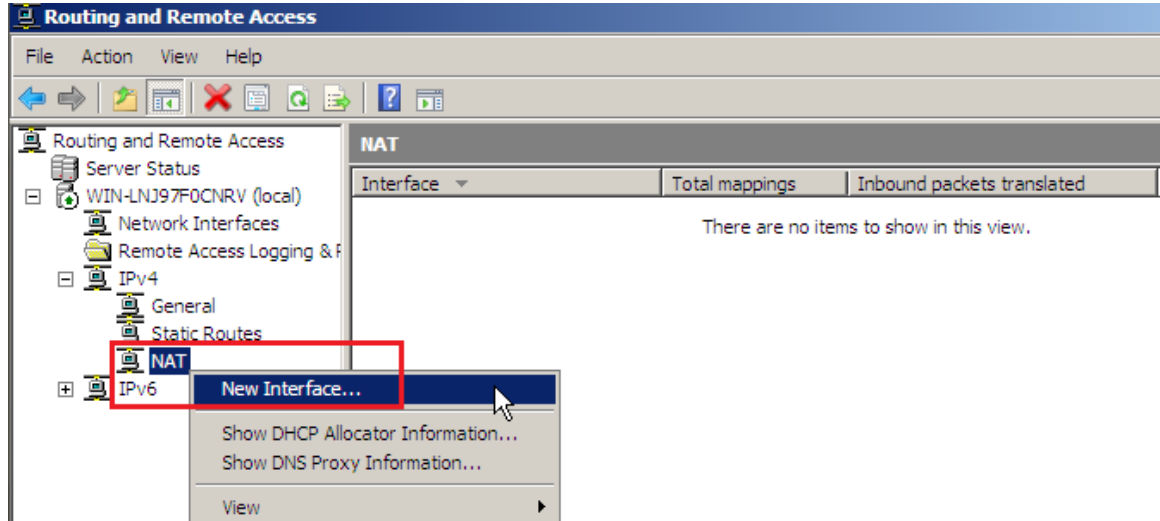
j. Tambahkan Routing Protocol baru melalui "IPv4 - General - New Routing Protocol..."



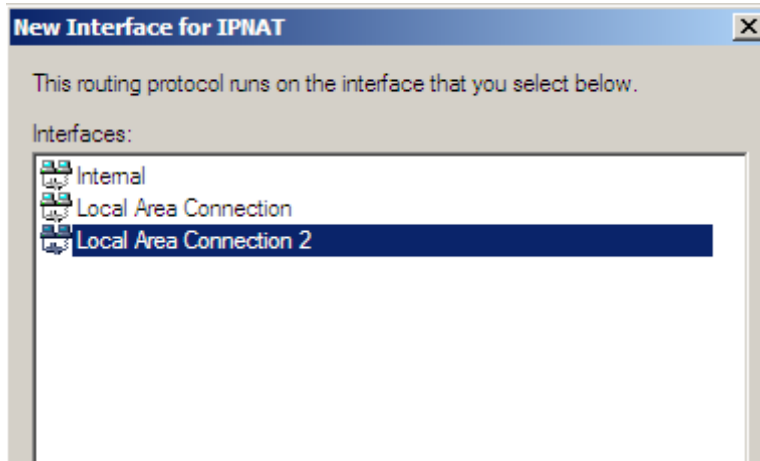
- k. Pilih NAT pada pilihan New Routing Protocol



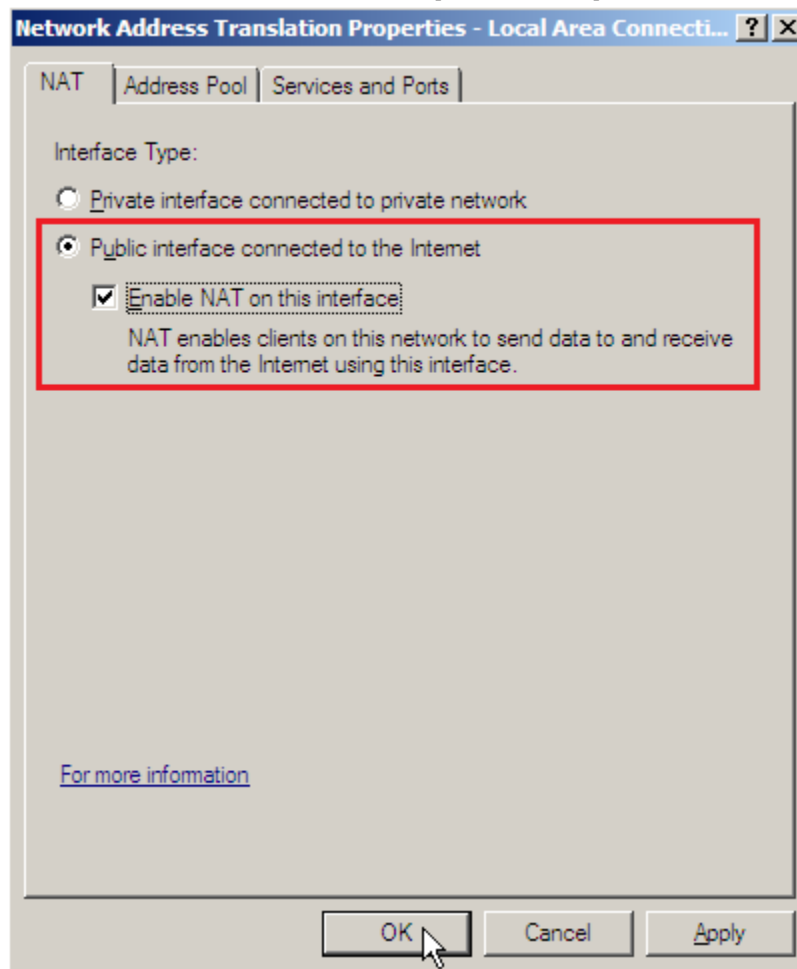
- l. Tambahkan interface baru pada NAT



- m. Pilih interface public

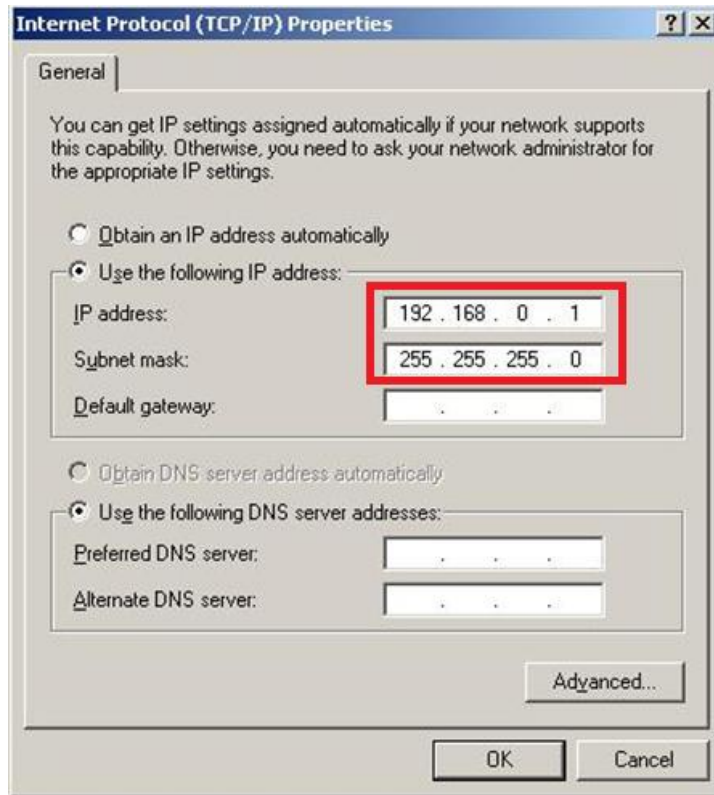


- n. Pilih Public interface dan Enable NAT pada NAT Properties

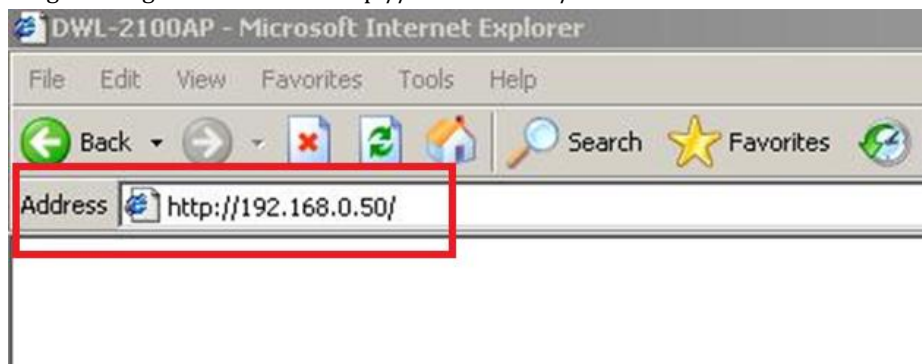


### 3. Melakukan konfigurasi Access Point

- a. Reset Access Point dengan menekan tombol reset di bagian belakang Access Point D-Link DWL-2100AP
- b. Sambungkan Access Point dan LAN-Card pada PC
- c. Ganti IP Address LAN pada PC menjadi 192.168.0.1



- d. Tes ping ke 192.168.0.50, jika sudah reply maka Access Point dapat diakses melalui web browser dengan mengetikkan alamat <http://192.168.0.50/>





- e. Gunakan username: admin dan password: <kosong> untuk login.



A dialog box titled "Connect to 192.168.0.50" with a key icon. It contains a "User name:" field with a dropdown menu showing "admin" and an empty "Password:" field. There is a checkbox for "Remember my password" and "OK" and "Cancel" buttons at the bottom. A red box highlights the "User name" and "Password" fields.

- f. Konfigurasi Wireless pada Access Point



A configuration page for a "High-Speed 2.4GHz Wireless Access Point". The left sidebar has buttons for "Wizard", "Wireless", and "LAN", with "Wireless" highlighted in a red box. The main area has tabs for "Home", "Advanced", "Tools", "Status", and "Help". Under "Wireless Settings", there are fields for "Wireless Band" (IEEE802.11g), "Mode" (Access Point), "SSID" (IT-student), "SSID Broadcast" (Enable), "Channel" (6, 2.437 GHz), and "Authentication" (Open System). A "Key Settings" section includes "Encryption" (Disable), "Key Type" (HEX), "Key Size" (64 Bits), "Valid Key" (First), and four key input fields. At the bottom, there are "Radio" (On), "Super G Mode" (Disable), and "Wireless Qos(WMM)" (Disable) settings. A red box highlights the "Apply" button in the bottom right corner.

g. Konfigurasi LAN

The screenshot shows the D-Link AirPlus Xtreme G web interface. The top navigation bar includes 'Home', 'Advanced', 'Tools', 'Status', and 'Help'. The 'LAN' button in the left sidebar is highlighted with a red box. The 'LAN Settings' section is also highlighted with a red box and contains the following fields:

|                 |                 |
|-----------------|-----------------|
| Get IP From     | Static (Manual) |
| IP address      | 192.168.0.50    |
| Subnet Mask     | 255.255.255.0   |
| Default Gateway | 0.0.0.0         |

At the bottom right, the 'Apply' button is highlighted with a red box, along with 'Cancel' and 'Help' buttons.

h. Konfigurasi Performance untuk optimasi performa.

The screenshot shows the D-Link AirPlus Xtreme G web interface. The top navigation bar includes 'Home', 'Advanced', 'Tools', 'Status', and 'Help'. The 'Performance' button in the left sidebar is highlighted with a red box. The 'Advance Wireless Settings' section is also highlighted with a red box and contains the following fields:

|                              |                |
|------------------------------|----------------|
| Wireless Band                | IEEE802.11g    |
| Data Rate                    | Auto           |
| Beacon Interval (20 - 1000)  | 100            |
| DTIM (1 - 255)               | 1              |
| Fragment Length (256 - 2346) | 2346           |
| RTS Length (256 - 2346)      | 2346           |
| Transmit Power               | full           |
| 802.11g Only                 | Disable        |
| Preamble                     | Short and Long |

At the bottom right, the 'Apply' button is highlighted with a red box, along with 'Cancel' and 'Help' buttons.

- i. Konfigurasi Filter untuk mengatur MAC-Filter

High-Speed 2.4GHz Wireless Access Point

Home Advanced Tools Status Help

Wireless Access Settings / WLAN Partition

Wireless Band: IEEE802.11g

Access Control: Accept

Mac Address: EE:EE:EE:EE:EE:EE Save

Apply Cancel Help

| MAC Address       | Delete | MAC Address | Delete |
|-------------------|--------|-------------|--------|
| ee:ee:ee:ee:ee:ee | X      |             |        |

- j. Konfigurasi Admin untuk mengatur password dan konfigurasi lain

High-Speed 2.4GHz Wireless Access Point

Home Advanced Tools Status Help

Administrator Settings

Limit Administrator IP

Limit Administrator IP 1

Limit Administrator IP 2

Login

User Name: admin

Old Password

New Password

Confirm New Password

- k. Melihat hasil konfigurasi keseluruhan

High-Speed 2.4GHz Wireless Access Point

Home Advanced Tools Status Help

Device Information

Firmware Version: v2.20eu

MAC Address: 00:19:5b:36:db:cc

Ethernet

Get IP From: Manual

IP address: 192.168.0.50

Subnet Mask: 255.255.255.0

Gateway: 0.0.0.0

Wireless (802.11g)

SSID: iT-student

Channel: 6

Super G Mode: Disabled

Rate: Auto

Security Level: Open System / Encryption Disabled